In the Claims

In the claims, please make the following amendments that are provided by substitution. Marked-up versions of the amendments to the claims follow the remarks section of this response.

1. A Coriolis flowmeter which measures densities of materials including combinations of gas and liquids, gas and solids, or solids and liquids, said flowmeter comprising:

at least one flowtube;

a driver that vibrates said at least one flowtube at a fundamental frequency based on a drive signal, said fundamental frequency corresponding to a density of material flowing through said at least one flowtube;

pickoffs affixed to said at least one flowtube that generate pickoff signals responsive to said material flowing through said at least one flowtube; and

meter electronics configured to:

determine said density of said material flowing through said at least one flowtube based on at least one of said pickoff signals,

monitor a drive gain in said at least one flow tube for a change in value to determine if said material flowing through said at least one flowtube comprises a multiphase flow, and

if said material flowing through said at least one flowtube comprises a multiphase flow, then determine said density of said material flowing through said at least one flowtube based on a stored density value.

2. The flowmeter as set forth in claim 1 wherein said meter electronics is further configured to determine whether said drive gain exceeds a first threshold value to determine if said material flowing through said at least one flowtube comprises said multiphase flow.

3. The flowmeter as set forth in claim 2 wherein said first threshold value represents that said multiphase flow includes gas and liquids.

4. The flowmeter as set forth in claim 3 wherein said meter electronics is further configured to determine whether said drive gain exceeds a second threshold value, said second threshold value represents that said multiphase flow includes liquid and solid matter.

~~5.~~ The flowmeter as set forth in claim 1 wherein said meter electronics is further configured to average historical density measurements over an interval of time to determine said density if said material flowing through said at least one flowtube comprises said multiphase flow.

~~6.~~ The flowmeter as set forth in claim ~~7~~ 5 wherein said meter electronics is further configured to apply a statistical analysis to said historical density measurements to eliminate or reduce spurious measurements.

~~7.~~ The flowmeter as set forth in claim 1 wherein said meter electronics is further configured to process density measurements obtained from laboratory measurements to determine said density if said material flowing through said at least one flowtube comprises said multiphase flow.

~~8.~~ The flowmeter as set forth in claim 1 wherein said meter electronics is further configured to process correlations to determine said density if said material flowing through said at least one flowtube comprises said multiphase flow.

~~9.~~ The flowmeter as set forth in claim 1 further comprising:

circuitry configured to close a valve to stop a well test in progress on a fluid flowing from a production well.

~~10.~~ The flowmeter as set forth in claim 1 further comprising:

means for indicating an alarm indicative of said multiphase flow.

~~11.~~ A method of operating a Coriolis flowmeter to measure densities of materials, said method comprising the steps of:

vibrating at least one flowtube of said Coriolis flowmeter at a fundamental frequency corresponding to a density of material flowing through said at least one flowtube;

generating pickoff signals that represent motion of said at least one flow tube as said material flows through said at least one flowtube;

determining said density of said material flowing through said at least one flowtube based on at least one of said pickoff signals;

monitoring a drive gain in said at least one flowtube for a change in value to determine if said material flowing through said at least one flowtube comprises a multiphase flow; and

if said material flowing through said at least one flowtube comprises said multiphase flow, then determining said density of said material flowing through said at least one flowtube based on a stored density value.

12 ~~15~~. The method as set forth in claim 11 ~~14~~ wherein said step of monitoring said drive gain includes comparing said drive gain to a first threshold value to determine if said drive gain exceeds said first threshold value to determine if said material flowing through said at least one flowtube comprises said multiphase flow.

13 ~~16~~. The method as set forth in claim 12 ~~15~~ wherein said step of comparing includes setting said first threshold value to represent that said multiphase flow includes gas and liquids.

14 ~~17~~. The method as set forth in claim 13 ~~16~~ wherein said step of comparing includes setting said second threshold value to represent that said multiphase flow includes liquids and solid matter and comparing said drive gain to said second threshold value to determine whether said drive gain exceeds said second threshold value.

15 ~~20~~. The method as set forth in claim 11 ~~14~~ wherein said step of determining said density of said material flowing through said at least one flowtube based on

said stored density value further includes a step of averaging historical density measurements over an interval of time to determine said density.

B13

16 15
~~21.~~ The method as set forth in claim ~~20~~ wherein said step of averaging said historical density measurements further includes a step of applying a statistical analysis to said historical density measurements to eliminate or reduce spurious measurements.

17 11
~~22.~~ The method as set forth in claim ~~14~~ wherein said step of determining said density of said material flowing through said at least one flowtube based on said stored density value further includes processing density measurements obtained from laboratory measurements to determine said density.

18 11
~~23.~~ The method as set forth in claim ~~14~~ wherein said step of determining said density of said material flowing through said at least one flowtube based on said stored density value further includes processing correlations to determine said density.